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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/566,598

06/30/2006

Beth C. Mullin

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EXAMINER

IBRAHIM, MEDINA AHMED

ART UNIT

PAPER NUMBER

1638

MAIL DATE

DELIVERY MODE

06/25/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/566,598	Applicant(s) MULLIN ET AL.	
	Examiner Medina A. Ibrahim	Art Unit 1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 April 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 52-54, 56, 61-64 and 76-78 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 52-54, 56, 61-64 and 76-78 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>04/27/09</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The advisory action of 06/01/09 has been **vacated** because the previous action dated 01/26/09 was Non-Final.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Applicant's response filed 04/27/09 in reply to the Non-final Office action of 01/26/09 has been entered. New claims 77-78 are added. Therefore, 52-56, 61-65 and 76-78 are pending and are examined.

All previous objections and rejections not set forth below have been withdrawn in view of Applicant's amendment.

Claim Rejections - 35 USC § 103

Claims 52-54, 56 and 61-64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guerinot et al (US 5,846,821 A) in view of Pawlowski et al (MPMI (1997), vol.10 (5), pp. 656-664; Applicant's IDS) and Terry et al (US 6,576,816). This rejection is repeated for the reasons of record as set forth in the last Office action of 01/26/09. Applicant's arguments filed 04/27/09 have been fully considered but are not deemed persuasive.

Applicants assert that the claimed invention is not obvious over the cited reference by Guerinot because it neither teaches that transgenic plants expressing a generic glycine-histidine rich polypeptide would typically be useful for heavy metal

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remediation nor provides evidence of a reasonable expectation of success. Applicant argues that Guerinot et al. teach that is a metal transporter that enhances metal accumulation by importing metal into the cell, but do not teach a polypeptide with metal binding property. Applicant cites Connolly et al. (Plant Cell, 2002, 14:1347-1357) to support lack of a reasonable expectation of success in producing plants capable of accumulating heavy metals from the environment or practicing methods of phytoremediation. Therefore, Applicant requests reconsideration and withdrawal of the rejection.

These arguments are persuasive for the following reasons: firstly, the transgenic plant of claims 52-54 and 56 do not require heavy metal remediation property. Secondly, since the isolated DNA encoding SEQ ID NO: 1 is well characterized and available in the prior art, one of ordinary skill in the art would be motivated to use it for plant transformation to produce a transgenic plant expressing SEQ ID NO: 1, with a reasonable expectation of success. Thirdly, assuming that Guerinot et al do not teach a metal-binding protein, the use of a DNA encoding a glycine-histidine rich polypeptide for the production of metal tolerant plants and the use of said metal-tolerant plants for phytoremediation are known in the prior as evidenced by Terry et al. At the time Applicant's application was filed, one of ordinary skill in the art was able to transform a plant with any known and well characterized DNA sequence like the DNA encoding SEQ ID NO: 1 of Pawlowski et al to produce transgenic plants with no unexpected results. Therefore, Applicant's arguments that no reasonable expectation of success was provided by the cited references are not probative. Finally, since the rejection is

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one of obviousness and not one of anticipation, Guerinot et al need not teach transgenic plants expressing a metal-binding polypeptide. Guerinot et al was relied upon because it provides the reasonable expectation of success for transforming a plant for heavy metal tolerance. Therefore, the cited reference by Connolly et al (2002) does not appear to support Applicant's invention.

Claims 52-54, 56, 61-64 and 76-78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guerinot et al (US 5,846,821 A) in view of Pawlowski et al (MPMI (1997), vol.10 (5), pp. 656-664; Applicant's IDS) and Terry (US 6, 576, 816) as applied to claims 52-54, 56 and 61-64 above, and further in view of Sharma et al (US 5,594,115 A). This rejection is repeated for the reasons of record as set forth in the last Office action of 01/26/09. Applicant's arguments filed 04/27/09 have been fully considered but are not deemed persuasive.

Applicant's arguments regarding Guerinot have been addressed above. With regard to Sharma et al, Applicant has not provided clear and convincing evidence as to why one of ordinary skill in the art would not be able to use the DNA encoding SEQ ID NO: 1 fused with a heterologous sequence in a genetic construct to transform a plant/cell with a reasonable expectation of success.

The following Examiner's amendment is suggested to place the application in condition for allowance:

Cancel claims 52-54 and 56.

Add the following new claims.

Claim 79 (New). A method of producing a transgenic plant having metal accumulating property, the method comprising introducing into the plant one or more genetic construct comprising an isolated polynucleotide encoding a polypeptide comprising the metal binding protein of SEQ ID NO: 1 operably linked a heterologous promoter; wherein the plant accumulates a heavy metal.

Claim 80 (New). The method of claim 79, wherein the genetic construct further comprises an isolated polynucleotide encoding the metal binding domain of SEQ ID NO: 4.

Claim 81 (New). A transgenic plant produced by the method of Claim 79.

Claim 82 (New). A transgenic plant produced by the method of Claim 81.

Claim 83 (New). A method for bioremediation or phytoremediation of sites contaminated with metals comprising: a) identifying a site suitable for bioremediation and containing contaminating heavy metals; b) planting transgenic plants according to claim 82 at said site; c) growing said transgenic plants at said site under conditions that allow for the accumulation of metals that contaminate said site; and d) harvesting said transgenic plants to remove the metal contaminants from the site.

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At claim 61, "claim 52" is replaced with ---claim 81---.

Cancel claim 63.

At claim 64, "claim 61" is replaced with ---claim 79---.

At claim 76, "or 3" is deleted.

Remarks

No claim is allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Medina A. Ibrahim whose telephone number is (571)272-0797. The examiner can normally be reached on M-TH 8:00 am to 5:30 PM, and every other Friday from 8:00 AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg can be reached on 571-272-0975. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MAI
6/22/2009

/Medina A Ibrahim/
Primary Examiner, Art Unit 1638

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